J. T. DANIELS.

ELECTROPLATING APPARATUS.

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911,578.

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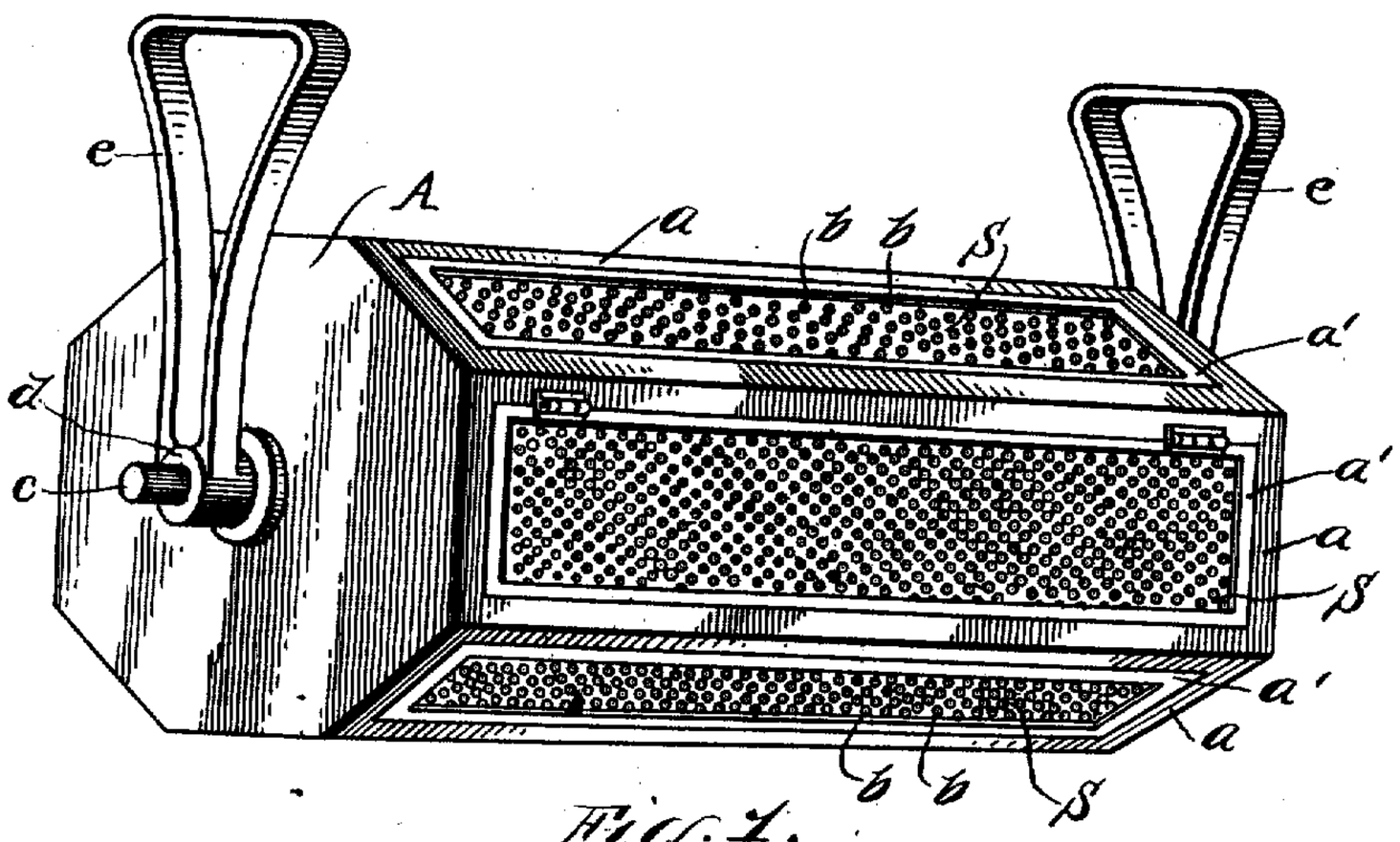


Fig. 1.

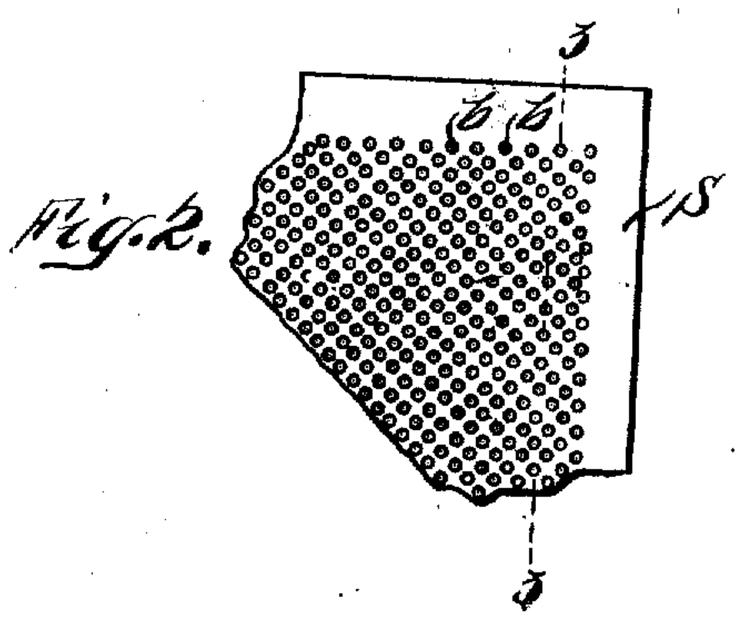


Fig. 2.


Fig. 3.

Witnesses:
C. A. Jarvis
Philip Peck

Inventor:
John T. Daniels
By Walter S. Edmonds.
his Attorney.

# UNITED STATES PATENT OFFICE.

JOHN T. DANIELS, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE HANSON & VAN WINKLE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## ELECTROPLATING APPARATUS.

No. 911,578. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed August 27, 1907. Serial No. 390,292.

*To all whom it may concern.*

Be it known that I, JOHN T. DANIELS, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electroplating Apparatus, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view, on a reduced scale, of a drum containing my invention; Fig. 2 a view on a full sized scale, of a fragment of a sheet comprising part of a side of said drum, and Fig. 3 a section on line 3—3 of Fig. 2.

My invention relates to the composition or constitution of the sides, of walls, of the so-called "drum", or container, in which are carried and rotated, or "tumbled", within the electrolytic bath, the articles being electroplated, and its object is to provide an article for such sides, or parts thereof, comprising a material which will impart to the art novel and improved results, economy in construction, and wear, and other advantages, unattainable by previous constructions.

Broadly speaking, my invention comprises the substitution of sheets, or panes, of celluloid, xylonite, or other material composed of nitro-cellulose mixed with other substances, for materials previously employed in the construction of the perforated sides of the drum.

Electroplating is, at present, too well understood to require a description of the usual, approved, apparatus used in the art, such, for instance, as is disclosed in U. S. Letters Patent No. 772,102 granted October 11, 1904 to Willis R. King. Such apparatus comprises a drum, or "container", means to lower the same with its contained articles to be electroplated, into the electrolytic solution, means to rotate the same, means to raise the same out of the bath, anodes suitably supported and disposed to convey the current from a source of electricity, through the bath and said articles, and, within the drum and contacting with said articles, suitable cathodes to return the current to its said source. The sides of the rotatory drum, or container, referred to have hitherto been constructed preferably of wood, containing perforations through which as is requisite, the electroplating solution may freely pass; but when, as is often desired, very minute objects, as for instance ordinary pins, are to be electroplated, it has been impossible to produce, in the wood, such perforations sufficiently large to impart, and maintain, requisite freedom of flow to the solution, and, at the same time, sufficiently small to prevent the undesired passage therethrough of said minute articles. Besides, the nature of the wood is such, being fibrous, absorbent, and easily abraded or disintegrated, as to result in such minute perforations becoming rapidly clogged, and even closed, under the conditions attending their said use in the electrolyte. I obviate these, and other, difficulties by my said invention.

Referring now to the drawings, Fig. 1 shows a drum, or container, embodying my invention. The drum A consists of any preferred form of frame *a*, *a*, composed of non-conductive material, in the instance illustrated of wood, to which is secured in any convenient manner, as per stop beads *a'*, *a'*, sheets, or panes, S, S, composed preferably of celluloid or xylonite, or of other mixture of nitro-cellulose with other material, resulting in a non-fibrous, homogeneous, substance capable of being readily drilled or punched, free from sulfur or other vulcanizing ingredients, and insoluble in, and unaffected by electrolytes used for electroplating or electrodeposition. Drum A is provided, and rotates with, a shaft *c*, connected by means, not shown, with a source of power. *c* rotates in journals *d*, to which are secured hangers *e*, by which connection is made with means, not shown, for suspending the drum, with its contained articles, and for lowering them into, or raising them out of, the electrolyte contained in a tank not shown. The said sheets, or panes, S, S, are provided with any required number of perforations *b*, *b*, which may, in their said constituent material, be made of any desired aperture, even extremely minute, as for illustration in Figs. 2 and 3, which shows a fragment, or corner, of the sheet and of its perforations on the scale of actual size though in said materials the perforations might be much smaller. The required perforations, notwithstanding their minuteness, do not, in the materials described, clog, nor become distorted, said materials being insoluble in, and unaffected by the electrolyte. Moreover, the material being homogeneous and non-fibrous, does not disintegrate nor expand so as to clog, close, or otherwise impair the efficiency of

the perforations. It is also, for the said purposes, extremely durable, is readily cut and punched and retains, at all times, under the working conditions maintained, a surface sufficiently smooth to insure the requisite movement during rotation of even the minutest objects under treatment. Moreover, my said material is quite transparent, thus affording, without opening the drum, opportunity to the operator to inspect, for many purposes and during rotation, the condition of the articles under treatment, and particularly whether same are tumbling freely or undesirably clogging, an advantage not obtainable by the use of any other material known to me to be obtainable or hitherto used for this purpose, glass being objectionable for obvious reasons. Furthermore, the celluloid or other like material above stated is, by reason of its inherent qualities, particularly well adapted for combination, for the purposes specified, with the wooden frame of the drum referred to, the two materials specified, viz: celluloid or the like, and wood, each possessing properties, including those above referred to, which render their said combination productive of advantages which could not be realized from a drum composed exclusively of either one of the said substances. It will be understood that the number, size, shape and arrangements of the said sheets or panes of celluloid, etc. may be varied from those specifically illustrated in the drawings without departing from my invention, an essential feature of which consists in constituting some part or parts of the retaining sides or wall of the drum of a sheet, or pane of perforated material consisting of celluloid or other substance containing nitro-cellulose, so that the perforations therein open directly and straight through the sheet both to the interior and exterior of the drum.

I am aware that it has been suggested that sheets of perforated hard rubber be used to over or under lay sheets of perforated wood in the construction of the sides of the drum, but such hard rubber would not, without prohibitory thickness, possess sufficient tensile strength to alone serve the purpose unless fortified by its associated wooden sheet which renders the combination open to all the objections to wood above mentioned; moreover the hard rubber cannot, owing to its texture and consistency, like celluloid be successfully punched, separately or simultaneously, to produce the required smooth edged perforations, which in hard rubber involve separate drilling whereby cost of production is increased, and furthermore the hard rubber being vulcanized, brings into the electrolytic solution a content of sulfur, or its compounds, which are acted upon by the ingredients of the solution so as to affect injuriously the metals electro-deposited on the articles under treatment, particularly, for instance, when silver plating is involved.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is the following, viz:—

1. In an electroplating apparatus, to support the articles treated, a drum, or container, comprising wall portions composed of a sheet of celluloid, substantially as and for the purposes described.

2. In an electroplating apparatus, to support the articles treated, a drum, or container, comprising wall portions composed of a sheet of material containing nitro-cellulose, substantially as and for the purposes described.

3. In an electroplating apparatus, to support the articles treated, a drum, or container, comprising wall portions composed of a sheet of perforated celluloid, substantially as and for the purposes described.

4. In an electroplating apparatus, to support the articles treated, a drum, or container, comprising wall portions composed of a sheet of perforated material containing nitro-cellulose, substantially as and for the purposes described.

5. In an electroplating apparatus, to support the articles treated, a drum, or container, comprising panes of celluloid, substantially as and for the purposes described.

6. In an electroplating apparatus, to support the articles treated, a drum, or container, comprising panes of perforated celluloid, substantially as and for the purposes described.

JOHN T. DANIELS.

Witnesses:
PHILIP C. PECK,
GEORGE G. MEASURES.